

Application No. 09/615,159, filed July 13, 2000

Reply to Office action of 01/20/04

**Amendment to the Abstract:**

Planar microfluidic devices[, modules containing an array of such devices for sensing properties of a fluid introduced in the module and methods for constructing same.]

The devices are laminate structures having a matrix layer at an upper side laminated at an interface to a lower substrate layer. The structure has one or more cavities extending from the upper side to the interface. A membrane is laminated on the upper side of the structure thereby to form a fluid barrier for the cavities. [Openings may be provided through the membrane at cavity locations to permit controlled fluid communication with the cavity.] Devices for use as electrochemical sensors further include an electrode at the laminate structure interface below the matrix layer cavity and a well through the substrate layer below the electrode for electrical communication.

The devices are made by using negative photoresists for the matrix and substrate layers and the closure membrane. The photoresists are first exposed to radiation, with the cavity and/or hole locations masked, and then developed to form the holes and cavities. The modules comprise an array of planar microsensors on a planar substrate with a perimeter wall on the substrate around them and a membrane cover over them sealed to the perimeter wall to create a chamber. Ports are provided in the chamber for introducing fluid for sensing. The wall, cover and additional support pillars may be formed of negative photoresists which are then fixed and sealed to one another and to the substrate by exposure to radiation.